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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,338	08/28/2001	John M. Caywood	CAY-006	8204

7590 12/27/2004
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EXAMINER

WEISS, HOWARD

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,338

Applicant(s)

CAYWOOD, JOHN M.

Examiner

Howard Weiss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-93 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-93 ~~is~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0901.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Attorney's Docket Number: CAY-006

Filing Date: 8/28/01

Continuing Data: This application is a CIP of 09/516,400 (03/01/2000 PAT 6,534,816)
which is a CIP of 09/275,168 (03/24/1999 ABN)
which is a CON of 09/275,168 (03/24/1999 ABN)
and is a CON of 09/731,942 (12/06/2000 PAT 6,479,863)
which is a CON of 09/522,252 (03/09/2000 PAT 6,384,451)

Claimed Foreign Priority Date: none

Applicant(s): Caywood

Examiner: Howard Weiss

Claim Objections

1. Applicant is advised that should Claims 73, 75 and 77 be found allowable, Claims 74, 76 and 78, respectively, will be objected to under 37 CFR 1.75 as being substantial duplicates thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
3. Claims 79, 80, 82 to 84 and 86 to 93 are rejected under 35 U.S.C. 102(b) as being anticipated by Koyama (U.S. Patent No. 5,517,044).

Koyama shows all aspects of the instant invention (e.g. Figures 4) including:

- a plurality of nonvolatile memory elements **Q** arranged in rows and columns (Figure 6)
- a semiconductor body **1** of P-type conductivity

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- first and second semiconductor regions **2a,b** of N-type conductivity with a channel **1a** between
- a polysilicon floating gate **4a**
- a floating gate dielectric **3a** in contact with said semiconductor body and said floating gate and over said channel region
- a retention dielectric **5a** of thickness between about 8 to 50 nm and adjacent said floating gate
- a grid electrode **6** adjacent said retention dielectric
- a tunnel dielectric **3b** adjacent said grid electrode
- a tunneling charge injector **10d** adjacent said tunnel dielectric

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. Claims 1 to 78, 81 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Tobin et al. (U.S. Patent No. 5,972,804).

Koyama shows most aspects of the instant invention (Paragraph 3) except for the grid insulator comprising SiO_xN_y with the oxide less than about 77% or graded, the

band gap, bias and fermi level functional limitations and the thickness of the grid electrode. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of Koyama to reduce the amount of leakage current density.

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since Koyama and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of Koyama and Tobin et al.'s invention.

Since the Applicant has not established the criticality of the thicknesses stated and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device of Koyama and Tobin et al. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214

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USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 65 of U.S. Patent No. 6,534,816. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claim a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes and oxygen-containing insulators. In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).
8. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 43 of U.S. Patent No. 6,479,863 in view of Tobin et al. U.S. Patent No. 6,479,863 claim most aspects of the instant invention including a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes. U.S. Patent No. 6,479,863 does not claim the oxygen-containing material comprising SiO_xN_y with the oxide less than about 77% or graded. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to

49). It would have been obvious to a person of ordinary skill in the art at the time of invention to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of U.S. Patent No. 6,479,863 as claimed to reduce the amount of leakage current density.

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since U.S. Patent No. 6,479,863 and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of U.S. Patent No. 6,479,863 and Tobin et al.'s invention.

9. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 59 of U.S. Patent No. 6,384,451 in view of Tobin et al. U.S. Patent No. 6,384,451 claim most aspects of the instant invention including a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes. U.S. Patent No. 6,384,451 does not claim the oxygen-containing material comprising SiO_xN_y with the oxide less than about 77% or graded. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to 49). It would have been obvious to a person of ordinary skill in the art at the time of

invention to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of U.S. Patent No. 6,384,451 as claimed to reduce the amount of leakage current density.

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since U.S. Patent No. 6,384,451 and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of U.S. Patent No. 6,384,451 and Tobin et al.'s invention.

10. The terminal disclaimers filed on 10/14/04 disclaiming the portion of any patent granted on this application which would extend beyond the expiration date of the patents listed has been reviewed and is NOT accepted. The terminal disclaimers do not comply with 37 CFR 1.321(b) and/or (c) because the terminal disclaimers were not signed by an attorney of record. The attorney who signed the Terminal Disclaimers (David B. Ritchie), although authorized to prosecute the application for the Applicants, is not a "recorded" attorney of record. The only listed attorney of record is Marc Hanish (reg. No. 42,626). Revised Terminal Disclaimers may be filed with either of the following:

- in combination with an Associate Power or Power of Attorney
- signed by an attorney already of record in the file

- which includes the statement that the attorney is “empowered” to act on the Applicants behalf/prosecute the application.

Response to Arguments

11. Applicant's arguments filed 10/14/04 have been fully considered but they are not persuasive. In reference to the objection to the duplicate claims, the amendment only made Claims 71 and 71 non-duplicates. The Amendments to Claims 73 to 78 were identical and the objection to these claims is retained.

In reference to the “tunneling charge injector”, feature **10d** is the tunneling charge injector (i.e. source region) in the device of Koyama not the floating gate **4b**. The claim language does not preclude the presence of the floating gate. The examiner is taking the definition of “adjacent” to be “close to” or “nearby” (see Webster's II New Riverside University Dictionary 1994).

The terminal disclaimers were deemed improper and revised disclaimers must be filed as stated above. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing

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date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

15. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/316, 321, 411	thru 12/22/04
Other Documentation: none	
Electronic Database(s): EAST	thru 12/22/04

HW/hw
22 December 2004



Howard Weiss
Primary Patent Examiner
Art Unit 2814